

ODD GRACEFULNESS OF TREES OF DIAMETER
FOUR WITH CYCLE

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Abstract: In 1991, Gnanajothi [3] introduced a labeling method called *odd graceful labeling*. A graph G with q edges is said to be odd graceful if there is an injection f from $V(G) \rightarrow \{0, 1, 2, \dots, (2q - 1)\}$ such that, when each edge xy is assigned the label $|f(x) - f(y)|$, the resulting edge labels are $1, 3, 5, \dots, (2q - 1)$. In this paper, we prove the odd gracefulfulness on trees of diameter four with cycle.

Keywords and Phrases: Odd graceful labeling, Cycle, Tress of Diameter four.

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1. Introduction and Definition

Rosa [5], in 1967, introduced the first graph labeling method called graceful labeling. A graceful labeling of a graph G with q edges and vertex set V is an injection $f : V(G) \rightarrow \{0, 1, 2, \dots, q\}$ with the property that the resulting edge labels are also distinct, where an edge incident with vertices u and v is assigned the label $|f(u) - f(v)|$. In 1991, Gananaajothi [3] introduced *odd graceful labeling*. An odd graceful labeling is an injection f from $V(G) \rightarrow \{0, 1, 2, \dots, (2q - 1)\}$ such that, when each edge xy is assigned the label $|f(x) - f(y)|$, the resulting edge labels are $1, 3, 5, \dots, (2q - 1)$. Lekha [4] proved the following results on cycle related graphs: Joint sum of two copies of C_n of even order, joining two copies of C_n of even order by a path, two copies of even cycles C_n sharing a common edge is odd graceful. Gnanajothi [3] proposed the conjecture, All trees are odd graceful. She also proved this conjecture for all trees with order up to 10. Christian Barrientos